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Bank Regulation and the Network Paradigm

Policy Implications for Developing and Transition Economies

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The blurring of boundaries between banking and the rest of the financial network has placed an upper bound on the effectiveness of banking regulation and supervision. Network externalities call for corrective action, but the redundancy and complexity of networks make successful interventions hard to design. So, a degree of modesty is appropriate in designing banking policy.



Summary findings

Current issues in banking policy range from the need to construct basic institutions and incentive structures in transition economies — to the challenges posed by the increasingly complex interactions involved in contemporary banking.

Honohan and Vittas outline the basic regulatory framework needed to reduce bank failures. Without measures that ensure risk diversification and adequate capital reserves, for example, you get bank failures, as recent experience shows.

Dissatisfaction with the diminishing effectiveness of postwar banking regulation led to substantial deregulation. Before adjusting to deregulation, bankers seemed vulnerable to a contagious euphoria, often manifested in overlending to property developers. Given the historic recurrence of carbon-copy banking failures, clearly private learning will not end all bank failure. And the disappointing performance of both regulated and unregulated financial sectors leaves a vacuum that theoreticians have been trying to fill.

Theoreticians note that banking increasingly displays network characteristics that, on the one hand, may call for corrective action but that, on the other, make policy intervention ineffective or counterproductive. For one thing, networks are susceptible to externalities, redundancy (ensuring that flows cannot be obstructed by blocking just one path), and a tendency to adapt to disturbances in a complex manner. Regulation is justified, but the complexity of the network makes successful interventions hard to design.

Supervision has a role, and Honohan and Vittas outline the basic regulatory measures needed. But the blurring of boundaries between banking and the rest of the financial network has placed an upper bound on the effectiveness of supervision. So, a degree of modesty is appropriate in designing banking policy. We have to put up with bank failures (mitigated by deposit insurance to protect small savers) but, they argue, partly because of network redundancy, the social cost of bank failure is not as high as is sometimes thought.

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**BANK REGULATION AND THE NETWORK PARADIGM:
POLICY IMPLICATIONS FOR DEVELOPING AND TRANSITION ECONOMIES**

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INTRODUCTION

The interdependence of banks and governments, the inexorable sequence of banking booms and busts, and the prevalence of regulatory controls all have a centuries-long history. Developing and transition economies are confronted with the need for liberalization at a time when deregulation in the market economies has presaged costly bank failures. At the same time, although there is little reason to believe that the unregulated financial system is always for the best, the growing complexity of the world financial system begins to militate against successful policy activism.

A review of banking policy issues must therefore necessarily cover a broad canvas. For this paper we have selected three major areas of current concern:

the need to establish basic mechanisms and incentive structures in transition economies, and in some of the poorest developing countries whose existing systems have proved dysfunctional;

the successive waves of bank failure which have affected both developing and industrial countries, especially since deregulation;

the challenge of designing policy for soundness, effectiveness and fairness of banking systems in what has become an increasingly complex set of interacting networks.

Though each is treated rather differently in the paper, the three areas are not unrelated. It is not only transition economies or the poorest developing countries which lack some elements of what we describe in Section 1 as the indispensable institutional framework (IIF) for ownership and control in banking required for even minimally adequate performance. The IIF involves clarifying the distinct goals of the fiscal and monetary authority, and of the bank and its borrowers, as well as avoiding unnecessary obstacles to enforceability of financial contracts. We provide extended examples here from two recent cases of financial systems that experienced periods of difficulty: the CFA franc zone in Africa and the former Soviet Central Asia.

A regulatory and ownership framework satisfying these minimal requirements and going beyond it co-evolved with early banking systems in industrial countries. But by the middle of this century the paraphernalia of regulation, both prudential and substantive, had gone far beyond this minimum. Excessive regulation, not only throughout the developing and planned economies, but also in the industrial world, had transferred too many powers to regulators and governments, restricted the pool of potential bank owners, distorted and muddled incentives, and degraded banking skills. Besides, even before the wave of pro-market ideology of the 1980s, technological developments were making it easier for the financial system to by-pass much of the regulation.

But the fashion and pressures for liberalization have been followed by a widespread increase in the incidence of bank failures. What went wrong? Section 2 examines the historical experience. Although bad policies, bad banking and bad luck each had a part to play in the recent spate of bank failures, suggesting the existence of a learning curve that may imply fewer banking failures in the future, the analysis also highlights the strong pressures to assume excessive risks notably in waves of euphoria associated with

property booms (especially in industrial countries) or in concentrated or self-lending (especially in developing world).

In seeking policy solutions for this more sophisticated environment, it is useful to recognize the network characteristics which are central to the functioning of banking systems and of financial systems more generally. This is the theme of Section 3, which shows how network aspects of various types are a recurrent theme of the recent theoretical literature. Networks tend to have three noteworthy characteristics: they are prone to externalities; they are robust to partial failure, and offer multiple alternative paths if one is blocked; and their complexity is such that intervening in one area will typically produce far-reaching and hard-to-predict effects. The three considerations pull policy design in opposite directions: although networks are not fragile, the pervasive externalities do call for intervention, but the complexity makes successful intervention hard to design.

Section 4 draws some policy conclusions from these theoretical and empirical perspectives. While the modern banking system needs a stronger financial constitution than would be provided by simply the IIF, both practical experience and the network considerations suggest caution in moving towards over-elaboration of control measures, including over-complicated rules for time-varying capital requirements and measures that give bankers substantial franchise value to discourage excessive risk-taking. Besides, with the continued trend toward blurring of boundaries between banking and other financial institutions, and the limited capacity of supervision, it will never be possible to eliminate bank failures. Inasmuch as the social costs of bank failure can be exaggerated, a certain incidence of failure should be regarded as acceptable.

So far as developmental and fairness-oriented policies are concerned, network considerations suggest, on the one hand, that correcting problems of this type can be very desirable but, on the other hand, that such measures can often be ineffective or counterproductive. These issues are illustrated by the debate over universal banking.

1 BASIC DISTORTIONS OF OWNERSHIP AND CONTROL

1.1 The Indispensable Institutional Framework

The exact degree and nature of the optimal constraints on bank ownership rights, and the best design for regulatory structures, is not a simple matter for a sophisticated financial system. But for economies which have difficulty in reaching even a basic level of adequate financial sector performance it seems possible (at the risk of some reductionism) to define the major pre-requisites of the minimally adequate or indispensable institutional framework (IIF). Underlying the idea of such a framework is the attempt to avoid the most glaring misalignments of private incentives with the public good.

The proposed IIF has three elements, relating respectively to central banking, banks and the contractual framework. *Central banks* should have the political and operational autonomy to influence interest rate and credit conditions with a view to protecting the value of the currency and the viability of banking and in particular should not be constrained to fund open-ended fiscal deficits. Such autonomy can be sought through legislation, but will have little real effect unless buttressed by political tradition and the force of public opinion, or by external pressures such as those often conveyed through the conditionality associated with IMF balance of payment support. *Banks* should have ownership and control structures which ensure that they are primarily autonomous profit centers, rather than responding passively to the demands of their borrowers or of the government. Regulatory intervention in their activities should be chiefly directed to ensuring solvent and safe and fair operation, and regulations should certainly not undermine solvency. Finally, governments must try to avoid legislative or administrative action which stands in the way of the basic functioning and enforceability of financial *contracts*.

In this view, most of the issues that pre-occupy the analysts of sophisticated banking systems are inherently of secondary importance. Issues such as the desirability of risk-weighting for capital requirements, bank privatization, the pros and cons of deposit insurance, and the relative merits of bank-by-bank credit ceilings and open market operations, are irrelevant if an IIF is not in place. Other important aspects, such as governance within banks --the agency problems of managers vis-a-vis shareholders-- are also important but derive their logic essentially from the overall incentive framework. The kind of financial constitution discussed by Vittas (1992c) and to which we return later, can be seen as an elaboration and development of the IIF.¹

Although the list of requirements of the IIF is a brief one, it is nuanced. A theme on which we would like to insist is that slogans are inadequate here. Privatization and central bank independence in particular are two slogans whose inadequacy has been exposed by instances in which the forms have been adopted, without the intended substance.

¹Thus, for example, information disclosure and prudential supervision are important elements of an ideal regulatory framework. However, countries with underdeveloped accounting and auditing standards will suffer from the poor quality of available financial information. Similarly, effective financial supervision requires the deployment of highly skilled and experienced examiners with well defined and significant powers of intervention, features that are likely to be absent in most developing countries. What the IIF implies for countries suffering from such gaps is that banks responding to the incentives of their owners would tend to extend credit for short-term, self-liquidating projects and against realizable collateral security.

Different types of banking malaise are characteristically associated with the absence of each of these elements. Experience in Latin America shows, for example, that a lack of central banking autonomy typically results in chronic inflation which shrinks the domestic financial market: even if commercial banks operate as autonomous profit centers under such circumstances (and some have done in Argentina and Brazil), the financial system as a whole suffers because savers place their money in real assets or in foreign financial markets. Alternatively, there are many instances (e.g. Egypt, Morocco and Tunisia in North Africa as well as India, Pakistan and Sri Lanka in South Asia) in which absence of autonomous commercial banks in an otherwise stable financial system with low inflation has resulted in endemic insolvency as commercial banks are forced to lend to unprofitable firms and carry nonperforming loans on their books.

But the best way to illustrate the importance of the IIF is by way of two highly negative examples of deep failure. Let us describe, in stylized manner, the substantial failure, not of individual banks, but effectively of entire banking structures, in two very different parts of the world - Former Soviet Central Asia and West Africa. Underlying the failures, we argue, are not only the undoubtedly severe shocks which buffeted these regions, but also the failure, appearances notwithstanding, to have an IIF in place.

1.2 Financial Vacuum in Central Asia

When Russia finally abolished the Ruble zone in the latter half of 1993, the financial systems of the peripheral zone members were in varying degrees of acute distress bordering on collapse. Even outlining the complex and dramatic historical background to this situation would take us too far afield, so we limit ourselves to describing the manner in which the elements of the IIF were not in place and how their absence contributed to the financial crisis.² Although the story was repeated, with variations, throughout most of the FSU, we focus on the Central Asian Republics.

Autonomy of central banking

The national central banks, which had been hastily constituted from the local offices of the former USSR State Bank, were far from being autonomous. Like many other central banks, even where formally independent of the fiscal authority, the central banks were certainly not independent of fiscal pressures.³ Each of the Central Asian Republics had lost a substantial fraction of their former fiscal resources as a result of the break-up of the Soviet Union. Combined with other pressures, this caused the fiscal authorities to turn to the central banks for credit, whether directly to the budget or to agriculture, or to state-owned enterprises whose long-term viability had been cast in doubt by the change in relative prices and the contraction of demand from the rest of the FSU. Monetization of these pressures would alone have contributed to high inflation (as it did in Russia itself), but there was more.

²It should be noted that the inherited institutional arrangements of these countries had not been altogether inappropriate or dysfunctional for the planned economy.

³In Kazakhstan as in Russia, the central bank was made independent of the executive, but under the authority of parliament, an arrangement which, if intended to protect the integrity of the currency, proved to be counterproductive. This is a good illustration of the proposition that legislative independence alone is not sufficient to produce a central bank which will behave autonomously in an anti-inflationary manner.

For none of the central banks of the ruble zone (apart from the Central Bank of Russia) could have had any responsibility for the integrity of the currency. This misallocation of institutional responsibilities had disastrous incentive effects. In a classic tragedy of the commons, each central bank extended ruble credit on a massive scale, as none internalized the inflation it was exporting.

It was inevitable that the currency union would collapse under the pressures of multiple central banks and, in mid-1993, it did so, forcing the Central Asian countries to introduce their own currencies in chaotic circumstances, and in a situation where the new central banks had established no anti-inflation credibility.⁴

Partly as a result of the political pressures, Central Asian central banks persisted for some time in irrational interest rate structures. Not only were real interest rates massively negative, but deposit rates could be higher than lending rates. Needless to say, the result was a deepening of the insolvency of banks, despite a widening of margins on uncontrolled segments of the market.

Ownership and control of commercial banks

Nor was the commercial bank element of the IIF in place. For, instead of being operated as autonomous profit-seeking institutions, the large banks saw themselves as serving their borrowing clients. Indeed, as time progressed, many of these banks were "privatized" by being converted to joint-stock corporations and issuing their shares, chiefly to their principal borrowers.⁵ In most cases both banks and borrowers were insolvent, though their official accounts did not proclaim this situation. Under these circumstances, the incentives for owners and management of the banks were not aligned to social benefit. Reacting in a predictable and even partly rational way, bankers' first priority was to secure enough of the under-priced central bank credit for their own clients. While the flows of cheap credit continued, new banks were established by the more energetic and well-placed manufacturing firms to act as additional conduits for these funds.

Even as high inflation eroded the real value of the uncollectible bank loan debts from the old regime, the new waves of credit during 1992-94 were thus mostly to the same, insolvent borrowers. It would have been relatively inexpensive to recapitalize the banks, and start them on a sound financial basis in early 1992; by 1994 the financial deficiency of the banking system had ballooned out again to a significant fraction of GDP. Indeed, the real stock of performing credit outstanding was much lower than had been the case before 1992.

To the extent that they operated outside the preferential credit regime, other new banks have been limited to providing little more than corporate treasury and payment services to their owners and other customers.⁶ If these new private banks also successfully compete for the business of the most mobile (and credit-worthy)

⁴Nominally valued at parity with the ruble, the Uzbek Som-coupon fell within a matter of weeks to R 0.15.

⁵In many cases these "privatized" banks remained wholly controlled by managers who were part of the state apparatus. The shareholders, drawn from employees and borrowing customers, were paid a fixed annual percentage dividend, without any expectation of sharing in good or bad profit outturns, just as if they were long-term depositors.

⁶As indeed has been happening on a larger scale in Russia, cf. Pohl and Claessens (1994).

borrowers, the state-owned banks can hardly avoid being caught in a downward spiral of worsening competitive position and an increasingly adverse loan-loss experience. Such a Darwinian process of evolution in the banking system may carry heavy costs on the way, not least the fact that a proliferation of new banks makes it difficult for depositors to discriminate between sound and unsound, and offers plenty of opportunities for incompetent or unscrupulous entrants.⁷

Enforcement of contracts

The final element of the IIF relates to enforcement of financial contracts, and here too the post-Soviet regimes have been weak. For one thing there has been the disruption of inter-republican payments.

Trade in intermediate goods between firms in what had been different regions of the Soviet Union and were now separate countries had been an integral part of the economic structure. Settlement of these transactions had involved the integrated banking and central banking system in a very centralized manner which was no longer available. Although the viability of many of their former customers was seriously in question, many enterprises, faced with no alternative market, agreed to ship without assurance of payments, and substantial arrears were accumulated. Without any adequate enforcement of financial contracts in the system, the risk that one might be delivering goods to an insolvent enterprise was greatly increased.⁸ The absence of a means of settlement for interrepublican transactions in the last eighteen months of the ruble zone, and the absence of a network of trusted banking correspondents were contributory factors - and these too can be seen as stemming from a failure of contract enforcement.

Similar pressures resulted in the accumulation of domestic arrears, both inter-enterprise and on the part of the governments. To what extent these reflected insolvency, and to what extent the emergence of an insouciant attitude to paying one's bills remains unclear.

Attempts to meet the problem of inter-enterprise arrears by means of occasional multilateral netting and settlement exercises, oiled by provision of low-cost central bank credit, were palliatives that merely fueled inflation.

1.3 A Fatally Rigid Institutional Arrangement: the Franc Zone

The sequence of events leading to financial sector failure in the franc zone countries of West and Central Africa are strikingly different, but the failure is almost as severe, and also reflects an inadequate institutional framework. In sharp contrast to the FSU, the underlying economic philosophy of the franc zone arrangements is that of an open and competitive market. Although established at independence, and not drastically altered since then,⁹ the institutional arrangements of the franc zone are strikingly modern in

⁷So far, depositors in Central Asia have lost more through negative real interest rates, and through difficulties in accessing their deposits, than in outright bank failure.

⁸Often seen as merely a technical problem of inadequate paper procedures, the real social costs of this problem lay both in the underlying real transactions, both those which took place but shouldn't have and those which didn't but should have. Much of the resulting arrears reflects economically wasteful production.

⁹Though the importance of the Africanisation reforms of 1973 are stressed by some.

appearance. In particular there have been multinational central banks¹⁰ (which are thus independent of any one national government), an open capital account, widespread presence of foreign-owned banks and the lowest inflation rates in Africa. From some points of view the regime has looked like a precursor to the proposed European Monetary Union with its single currency, its freedom of capital movements and its multinational central bank. Nevertheless, we argue that it has not had an IIF.

For many years economic performance of the franc zone countries appeared to justify the high expectations which had been placed in the arrangements. In the end, however, the very rules on which the franc zone was built proved to be the rock on which it foundered, bringing the functioning of the banking system almost to a halt in several of the countries. By 1993 all of the countries in the zone were in deep recession. A parallel market in the CFA franc had opened up, and not only were capital movements now blocked, but effecting current international payments had become difficult. A majority of the banks had failed, though some had been recapitalized or rescued in one form or another. Depositors in many banks had gone without access to their funds for years. The interbank market was barely operating. The central banks were close to being unable to cover their operating expenses.

Ownership and control of the banks

Given prolonged and ultimately accurate speculation of a major devaluation,¹¹ it is easy to see why the banking systems should have ended up in an illiquid position. But there was more to it than that. For years the governments in several member states had directly or indirectly pushed the banks into lending to state-owned enterprises, or to regional and political groupings, or simply to some of the governments' own suppliers who had not been paid. Over the years, the share of borrowers who couldn't or wouldn't repay, including those who took a politically-driven loan to be equivalent to a grant, grew.

Why did these banks, operating after all in a market environment, agree to make these loans? How did they attract resources to make such onlending? Here is where the ambiguity of ownership and control rights becomes central, and the lack of an IIF becomes evident. For the role and mission of the major banks was far from clear. Most were joint ventures between the national governments and one of four major French-based banks; sometimes the government was the majority shareholder, sometimes not. In either case, the key senior management was provided by French nationals seconded from the parent banks in France. But the objective of the parent banks is likely to have been complicated by wider issues than narrow profitability (such as serving the commercial interests of their French customers). Although formally autonomous, the operations of these joint-venture banks were highly constrained by political considerations.¹²

Qualified autonomy of the central banks

¹⁰There are two separate unions, comprising six and seven countries respectively, and with central banks located in Cameroon and Senegal.

¹¹The CFA franc was devalued by 50 per cent in January 1994, after almost half a century of stability.

¹²The same was true *a fortiori* for the wholly government-owned development banks; but that is a standard story, applicable to scores of countries.

Nor were the banks constrained by lack of loanable resources. Though inhibited from much lending to governments, the two regional central banks were free to refinance lending through the banking system, and they effectively provided the necessary resources. So although the central banks were apparently freed by statute from any fiscal pressure, they nevertheless succumbed to indirect pressure to lend through banks for relief of fiscal needs. Systematically it proved to be the insolvent banks that had relied most on the central banks for refinancing. Even the central banks' self interest in preserving the quality of their own balance sheet (in order to ensure adequate revenue to meet their not insubstantial operational expenses) was not sufficient to limit their lending to doubtful banks. For (at least in the Western part of the zone) the statutory arrangements were understood to provide the central bank with a government guarantee of lending to banks. Thus was the circle completed and the apparently cautious rules built into the system subverted. The central banks, nominally independent, acted as if they were agents of the fiscal authorities, refinancing politically directed or government-inspired bank lending that could never be repaid. The confusion of ownership and control responsibilities that resulted certainly implies that the central banking aspects of the IIF were also absent.

Official payment arrears

Mention has already been made of the domestic payment arrears which several of the zone's governments ran up, and which contributed to the illiquidity of the banking system. This degree of payment indiscipline certainly violates the contract enforcement principle which is also part of IIF, and which was already undermined by the difficulties of obtaining judicial judgments in the case of loan delinquencies.

The IIF was thus achieved neither in respect of commercial or central banks, nor in respect of contract enforcement. The low level of deposit mobilization - often attributed to the open capital market in the zone - can be seen as no coincidence. Against this institutional background, the banking system proved unable to cope with the severe macroeconomic shocks that are endemic in Africa.

Excessive institutional rigidity

The rigidity of the institutional framework established for monetary and banking arrangements in the franc zone lulled policy-makers into a false sense of security. These rules did not guarantee an IIF, and indeed the very rigidity of the rules induced an evolution of banking practice which violated the IIF by subordinating both commercial and central banking to fiscal pressures.

1.4 Lessons of Deep Failure

The relation between government and banks needs to be governed by an institutional design that assigns responsibility in a manner which will have some hope of surviving political pressures and macroeconomic shocks. Any attempt to transplant a full-fledged institutional model on a society which is emerging from the planned regime, or from deep financial sector failure emanating from some other cause such as hyperinflation is unlikely to be wholly successful. If the essential features of the IIF are lost in the transplant, as happened in the franc zone, then not only will the system underperform, but it is prone to massive failure. It is probably a bit harsh to judge the FSU case in these terms: the macroeconomic and structural shocks undergone by these countries would have severely tested any banking system.

Nevertheless, in neither case did the banks or the central banks have an ownership and control structure which provided incentives to prevent the diversion of massive volumes of loanable funds into lost causes. Because banks were not autonomous profit seeking entities, free of commitments to over-indebted shareholders, the monetary expansion left the banks with a blocked portfolio, suspicious depositors, and

little access to credit by the few viable borrowers who must represent these countries' economic future. In both cases, financial indiscipline led by governments who declined to pay their bills on time exacerbated the crisis.

Reform measures are either already in place or planned in each of these countries. Lessons may have been learnt. The challenge of substantial structural transformation of the real economy remains in Central Asia; that of increasing productivity and growth still faces West and Central Africa.

Although the examples are extreme and the lessons to be learnt may seem simple, there are echoes of these cases in the stories of many other developing country experiences over the past quarter century. The messages have a wide relevance. With the current vogue for updating central bank and commercial banking legislation in developing countries, it is important to recall that the IIF is not just a set of rules to be enacted into legislation and then ignored.

2. DEREGULATION AND LIBERALIZATION: WHAT WENT WRONG?

The specification of optimal banking regulation clearly goes beyond the basic precepts of the IIF discussed in the previous section. Furthermore, the adequacy of the generally liberal, albeit nuanced, framework outlined above may be called into question when one considers the history of banking crises that has been associated with liberalization. This section reviews that experience.

Most developed and developing countries suffered from banking problems of one sort or another during the past twenty years. In some countries, the problems were manifested in bank failures and even systemic crises. In these cases, the authorities were often compelled to intervene to rescue failing banks and prevent a collapse of the banking system. Such interventions proved costly and raised questions about the scope and impact of deregulation. In other countries, banking problems were more endemic in nature and tended to be hidden by the failure to make adequate provisions for nonperforming loans. In the latter countries, banks tended to be state-owned and continued to operate even though they were technically insolvent. Ironically, such banks were often perceived as highly profitable and were required to pay sizable profit taxes. But eventually they were compelled to recognize their loan losses and required capital injections. Thus, intervention costs were high even in countries that did not deregulate and reform their banking systems.

The direct costs of intervention are only part of the economic costs suffered from banking systems that are prone to epidemic or endemic crises. Perhaps a much bigger problem derives from the misallocation of resources that malfunctioning banking systems may cause. The challenge for the authorities is to help create systems that will avoid the excesses and abuses of both heavily and lightly regulated markets. Devising and applying consistently an optimal system of regulation is not an easy task as is demonstrated by the recent experience of banking systems in some highly developed countries.

2.1 The regulatory process

It is now widely accepted that the regulatory process is an endogenous response to changes in the financial system, especially to financial crises and to real or perceived problems in the functioning of financial systems. The panoply of regulations that was imposed on banks in the aftermath of the Great Depression was motivated by the bank panics and failures that occurred in the 1930s after a period of euphoric growth and overexpansion. And the deregulation that started to occur in the late 1950s and accelerated sharply in the 1970s and 1980s was a response to the real or perceived costs of regulation and to the changing environment within which banks operated.

In the 1950s and 1960s, most developed countries had heavily regulated banking markets. Except for Germanic countries, commercial banks in most countries were prevented from engaging in long-term lending and investment banking. Banking markets were heavily segmented. Many countries imposed geographic restrictions on all or some of their financial institutions. Branching controls discouraged the expansion of branch networks and interest rate controls (either government imposed or operated by officially sponsored cartels) limited the ability of banks to engage in price competition. Credit ceilings restricted the expansion of credit, while selective credit controls favored the provision of credit to priority sectors, often by government-owned or sponsored institutions. Domestic controls were supplemented by strict foreign exchange controls. There were restrictions on foreign bank entry as well as on domestic entry and exit, including restrictions on mergers. There were also controls that repressed the development of

securities markets and discouraged nondeposit institutions as well as nonfinancial companies to compete with banks and other deposit institutions.

In developing countries, banking and financial markets were, and still are, more heavily regulated than in developed countries. Credit ceilings and interest rate controls were generally more binding, directed credit programs more pervasive, and state intervention more extensive. The markets of most developing countries were dominated by state-owned commercial and development banks. Moreover, in many countries, even individual lending decisions were controlled as loans above a certain size required the prior authorization of the central bank or ministry of planning. Many of the loans were granted to state-owned industrial companies at heavily subsidized rates and with a poor repayment record. In former communist countries, banks were operating as mere disbursing agents for credit allocations already decided by other state entities.

The basic motivation of these controls was to create stable banking systems that would help finance industrial and other sectors deemed to have higher economic priority. It is fair to say that, in most developed and a small number of developing countries, the controls had little negative effect in the first fifteen years after the end of the war and may even have had a positive effect on the effort for economic reconstruction and recovery. The controlled markets may have facilitated the financing of heavy industries and capital-intensive infrastructure projects that were essential for economic recovery, especially in the countries that suffered heavy destruction of their productive capacity during the war. By discouraging lending for consumption purposes and especially for speculative real estate development, the controls may also have contributed to financial stability. Some of the controls, such as credit ceilings and interest rate controls, prevented banks from competing aggressively for loans or deposits and may thus have strengthened prudent banking practices. In the regulated and competitively subdued financial systems of the 1950s and 1960s, banks and other financial institutions were able to operate with high margins that ensured respectable profits and returns on equity.

But the authorities, at least in the more advanced countries, were concerned about the stifling effect of all these controls on competition and innovation and about their long-term impact on efficiency. A main policy issue also related to the coverage of controls. As new institutions were created to fill gaps in the provision of financial services, especially finance companies that specialized in providing real estate development finance and consumer credit,¹³ the authorities were faced with the dilemma of expanding the coverage of controls to the new institutions and thus stifling both institutional and product innovation or allowing unregulated institutions¹⁴ to coexist and compete with tightly regulated ones. The latter stimulated innovation and competition but undermined the effectiveness of controls and also had an adverse effect on the relative competitive position of the institutions that were subject to controls.

¹³Some of these finance companies were established by commercial banks in an attempt to bypass the restrictive regulations.

¹⁴To be sure, these institutions, which included finance companies and other secondary banks and in some cases foreign banks were not unregulated institutions in the full sense of the term but they were not subject to the full panoply of controls as the main commercial banks in different countries.

Although the process of deregulation was gradual and incremental, it did encompass most types of controls, from branching and geographic restrictions to institutional demarcation lines and to credit ceilings and interest rate controls.¹⁵ The deregulation process was interrupted in the mid to late 1970s as a result of the aftereffects of the oil crisis, but it resumed in the 1980s when its main focus was the removal of structural controls. Exchange controls were abolished. Domestic markets were opened to foreign competition and domestic banks were allowed to expand in overseas markets. Banks were authorized to operate as universal banks. Stock exchanges were reformed and their membership opened to banks and other institutions. Banks and insurance companies were allowed to join forces in marketing and distribution.¹⁶ The restrictions that discouraged the development of bond and commercial paper markets were removed in country after country. The deregulation process was spurred by advances in telecommunications and information technology that made easier the bypassing of continuing restrictions through overseas markets or through new institutions such as money market mutual funds.

In developing countries, the imposition of strict credit ceilings and other controls prevented banks from engaging in imprudent and highly cyclical asset-based finance. Thus, the heavily regulated banking systems of developing countries were immune from epidemics of banking euphoria followed by banking crises. But on the other hand, failure to suspend interest accrual on nonperforming loans and to make adequate provisions against doubtful debts resulted in an endemic situation of technically insolvent banks and persistent misallocation of economic resources, with detrimental effects to long-term growth.

Directed credit programs were a major tool of development policy in both developed and developing countries in the 1960s and 1970s. Such programs were used to provide finance at preferential terms to high priority industry, exports, small enterprises, and rural and housing credit. During the 1980s, the realization that most of these programs had resulted in distorted incentives among both lenders and borrowers led to a reconsideration of their rationale and effectiveness. The experience of most countries around the world showed that directed credit programs stimulated capital intensive projects, suffered from abuse and misuse of preferential funds for nonpriority purposes, increased the cost of funds to nonpreferential borrowers, involved a decline in financial discipline that resulted in low repayment rates, and contributed to a swelling of budget deficits.

Japan and Korea were probably the only notable exceptions. Their experience suggests that the success of directed credit programs depends on good design and effective implementation (Calomiris and Himmelberg, 1995; Vittas and Cho, 1995). But in most developing countries few, if any, of the essential conditions for effective credit programs were met.¹⁷ Dissatisfaction with the experience of direct controls became very

¹⁵ Somewhat ironically, the first country to remove controls was Germany, which had in the late 1950s and early 1960s the fewer and less binding controls. But its example was followed by other countries in Europe and elsewhere.

¹⁶ However, banks and insurance companies have not been allowed to merge fully their accounts and operations.

¹⁷ As summarized in Vittas and Cho (1995), well designed credit programs must be small in size, narrowly focused and of limited duration; they should involve a low subsidy; be financed with long-term resources; should promote industrialization and exports; and should form part of a broader credible vision of economic development, promoting growth with equity, and involving a long-term strategy to develop a sound financial system operating on economic criteria. Good implementation requires channelling policy-based loans through well capitalized,

pervasive and led to a process of deregulation in most developing countries that involved the elimination of directed credit programs, removal of interest rate controls and replacement of credit ceilings with indirect methods of monetary and credit control. The removal of direct controls was accompanied by a strengthening of prudential regulation and supervision and by a privatization of state-owned banks, although progress in these two areas varied considerably across countries.

2.2 Bank failures

Deregulation was prompted in both developed and developing countries by concerns about the stifling effect of direct controls on innovation and efficiency and about their growing ineffectiveness in the face of technological and institutional changes. But deregulation did lead to unwise expansion of credit, to ill-conceived and badly managed diversification into nonbanking markets, and to abuses of lending to related parties. In developed countries, the main problem seemed to be excessive lending for property development, while in developing countries the main problem was an excess in insider lending.

The early phase

The first significant crisis of the 1970s was the secondary bank crisis in the United Kingdom in the early 1970s. This involved a group of relatively small, undercapitalized and poorly supervised banks that engaged in excessive lending in real estate development. However, the large commercial banks also suffered big losses and in fact one of the biggest banks had to issue a denial that it was about to fail.¹⁸

Far more important problems occurred in the Netherlands, Germany and Spain in the late 1970s. The problems in the Netherlands and Germany were related to the large increase in international interest rates following the sudden change in the policies of the Federal Reserve in the US and the collapse of the local property markets. Thus, in the Netherlands all mortgage banks failed in the late 1970s. Although they were supposed to borrow long and lend long, they suffered from their residual exposure to interest rate risk and from credit losses. The Dutch mortgage banks were absorbed either by the large universal banks or by insurance companies. In Germany, most mortgage banks had already been taken over by the universal banks (including the Landesbanks). Thus, there were no bank failures as such, although most universal

administratively capable and autonomous financial institutions as well as use of clear, objective and easily monitored criteria with detailed project appraisals, close supervision of disbursement, and monitoring of performance and repayment records. And finally they should be supported by effective mechanisms for communication and consultation between the public and private sectors, including the collection and dissemination of basic market information. However, credit programs have proved difficult to remove even in Japan and Korea. They have tended to outlive their usefulness and, especially in Korea, they have left a legacy of nonperforming loans.

¹⁸In the mid-1970s, the failure of Herstatt, a small German bank specializing in trade finance, attracted considerable attention. This was because of the fear of possible domino effects in the international foreign exchange market and a disruption of international payments, but once the liquidity problems created by its failure were addressed, the Herstatt incident had little impact. It was in some respects similar to the recent failure of Barings, causing a reconsideration of internal control systems but without any systemic crisis.

banks suffered huge losses and Commerzbank (the third largest German bank) was forced to replace the whole of its management board.¹⁹

A much more interesting case was that of Spain. Banks in Spain have long had extensive equity stakes in industrial and commercial companies, but most of these holdings were dormant with very little bank involvement in corporate management and a generally poor performance by both banks and industry. The situation changed in the 1970s with the amalgamation of commercial and industrial banks (permitted in 1974). Some banking groups started to take a more active interest in industrial and commercial companies and to manage them more actively with a view to generating additional revenues and financial power for the bankers that controlled the banks. A case in point was that of the Rumasa Group, which grew at a spectacular rate in the 1970s on the basis of complicated and very obscure links between different companies in the group (Caminal et al., 1990). In this respect, Spain (alongside other Southern European countries) was more like developing countries in Latin America and East Asia rather than other OECD countries.

The later phase

Banking crises in the 1980s were more numerous and more serious. Many international commercial banks suffered huge losses when the LDC debt crisis erupted as developing countries suspended the servicing of their debts. But loan renegotiation and rescheduling as well as gradual write-offs and loan loss provisioning averted failures of large commercial banks. The crisis of the savings and loan associations (thrift institutions that specialized in housing finance) proved more difficult to contain (Kane, 1985, 1989; White, 1991). These institutions suffered two crises: one in the early 1980s resulting from their heavy interest rate mismatch caused by funding 30-year fixed-rate mortgages with short term deposits; and the second in the mid-1980s that resulted from granting to the insolvent thrifts expanded powers to engage in commercial lending, real estate development and other activities that were substantially more risky than housing finance. The second savings and loan crisis culminated in the insolvency of their deposit insurance fund, a massive intervention by the authorities, and a loss to US taxpayers of the order of US 150 billion dollars in present value terms, equivalent to 3% of GNP. This is probably the largest loss from banking failures in absolute dollar terms, though not in relation to national income.

The thrift crisis was particularly acute in oil producing states, such as Texas, where real estate prices were correlated with energy prices. The collapse of oil prices in the mid-1980s also had a deleterious effect on commercial banks. A banking crisis caused by falling real estate prices affected first oil-producing states but then spread to North-Eastern and South-Western states. An unprecedented number of banks failed, including some large banks. Many of these were rescued by merging with other banks, although some large banks could not avoid closure. The Bank of New England was the largest bank that was forced to close down. Even Bank of America (in the mid-1980s) and Citibank (in the late 1980s) came close to failure and had to take corrective measures that were effectively dictated by supervisory authorities. Most failed banks had huge exposures in real estate related lending and had experienced a period of very rapid and unsustainable growth prior to their failure.

¹⁹Commerzbank was probably technically insolvent at the time, having suffered enormous paper losses from the rise in interest rates.

The experience of American oil-producing states was repeated in Norway. Nearly the whole of the Norwegian banking sector was rescued and taken under state ownership following the collapse of the oil price in 1986, the plummeting real estate prices, and the massive bankruptcies and credit losses suffered by banks. The crisis in Norway was soon followed by similar crises in Sweden and Finland, although the circumstances and proximate causes were different. Swedish banks, and finance companies that borrowed from them, had large exposures not only to domestic real estate but also to foreign property markets. Banks in Finland were also adversely affected by the economic contraction of the former Soviet Union and the East Block more generally. In both Sweden and Finland, the authorities intervened to rescue several banks and provided extensive liquidity support to the whole system.²⁰

Other countries did not experience the systemwide failures of Scandinavian countries but they did suffer from banking problems that caused large losses for most banks and forced some banks to closure and/or rescue by other banks. Many countries experienced a severe real estate cycle. The expansion phase of the cycle was fueled by a large increase in bank and finance company credits. When the boom was followed by the bust, banks in the United Kingdom, the United States, Japan, France, Australia, Canada, Spain, and even Switzerland were hit by losses mostly from the failure of property developers (Renaud, 1995), though defaults by households on their mortgage and consumer loans also became a growing problem, especially as many households found themselves with negative home equity. The effects of the real estate cycle were compounded in most countries by the onset of economic recession in the early 1990s that gave rise to nonperforming loans to small and medium sized firms. During this period of upheaval and crisis, the only two major countries that seemed to be little affected were Germany and the Netherlands, perhaps because the memories and lessons of previous excesses were still fresh.²¹

During the 1980s, Canada experienced its first bank failures for over fifty years. In Switzerland, regional and even cantonal savings banks were rescued by merging with the large Swiss commercial banks. In France, *Crédit Lyonnais* was hit by very large losses in real estate, industrial lending and lending to failed international ventures and was the object of a massive rescue by the French government. Other French banks also suffered substantial losses from property lending.

The indications are that the unfolding Japanese banking crisis could prove to be exceptionally severe. So far, there have been just five failures since December 1994 - four credit cooperatives and one regional bank. But these account for only a small fraction of the total nonperforming loans of the Japanese banking and near-banking system, now unofficially estimated at nearly \$600 billion, or about 12 per cent of GNP, and mostly real estate related. Just why Japanese banks have been so careless in their lending to finance companies and property developers is unclear, considering how meticulous they have been in the past in lending to industrial groups. One factor may have been the huge deposit inflows which they experienced as

²⁰The original cost of state intervention in the three Nordic countries is estimated at 4.5 per cent of GNP in Norway, 6.2 per cent in Sweden and 14.7 per cent in Finland (Koskenkylä, 1994; Renaud, 1995), though the long-term cost is likely to be smaller because of some loan recovery and capital gains generated in reprivatizing the banks.

²¹UK banks indulged in excessive property lending in the late 1980s despite their earlier and not too distant losses in the early 1970s. This, and the recurrent crises of the 19th century, suggest that institutional memory may be limited to less than 10 years.

many enterprises increased their liquid assets following capital market issues. As well as lacking an effective crisis resolution mechanism, the Japanese system has suffered from poor disclosure and weak supervision, especially of the smaller institutions, among whom the authorities have created moral hazard by responding to the crisis with forbearance. At the macropolicy level the reaction to asset inflation was one of benign neglect, similar to that observed in most other countries with soaring equity and property prices.

Apart from imprudent lending, banks also suffered from fraudulent activities. In Greece, the Bank of Crete collapsed amid allegations of extensive fraud and political entanglements. In Spain, Banesto, the largest bank, failed and was taken over by a smaller bank (Banco Santander) when its management manipulated its share price by improper dealings in the industrial shares held by the bank's holding corporation.

The biggest single banking fraud was the collapse of BCCI, an international bank with operations in dozens of countries but with obscure ownership and management that had long engaged in illegal activities, including money laundering.

Developing countries

We have already described in some detail some of the most severe examples of failure in the developing world. But the experiences of the franc zone and the Central Asian Republics are by no means unique.

The first developing country to suffer from a large and widespread crisis was Chile. The Chilean experience has many similarities with what happened in Spain, although the crisis was deeper and the problems far more extensive. Chile privatized and deregulated its banking and financial system in quick fashion in the mid-1970s. The privatization program allowed various industrial groups to buy the banks on credit and the groups then used loans from their own banks to buy other privatized firms (Cortes-Douglas, 1992). This gave rise to large amounts of related lending and violated a basic principle of prudent banking whereby a bank should not lend to its own shareholders to finance their contribution to the bank's capital.²² The privatized banks performed very well during the period of economic expansion that followed the economic liberalization and macroeconomic reform policies of the 1970s. But they were also increasingly involved in lending to related firms for speculative ventures and the private groups also borrowed extensively in dollars. When the exchange rate was devalued and the economy suffered a big recession, most private banks were in deep trouble and the authorities intervened and took over 60% of the banking system at a cost of nearly 25% of GDP. After the crisis, the Chilean authorities introduced a very robust system of prudential regulation and proceeded to reprivatize the banks, with a requirement that part of future profits would be used to repay the central bank for the capital spent in rescuing the banks.²³ At the

²² It is claimed (though no firm evidence is available) that a similar approach was followed in the recent privatization of Mexican banks. Allowing new owners to borrow from the banks they buy contributes to higher bids and may thus inflate the prices fetched by the government in selling the banks. But it is a policy pregnant with dangers. It burdens the banks with large amounts of related lending and may require large spreads in order to recoup the inflated prices paid for the banks.

²³ An important policy issue concerns the extent of moral hazard and adverse selection in the Chilean crisis. It seems that the groups that acquired the banks engaged initially in genuine expansionary finance, both for their groups and for their other customers. But when their groups faced severe financial difficulties, the banks expanded their related lending in an effort to save their groups and engaged in bad banking practices, throwing good money

time of the Chilean banking crisis, other Latin American countries, including Argentina, Colombia, Mexico, Uruguay and Venezuela, also faced severe banking problems (World Bank, 1989; Brock, 1992).

Outside Latin America, Turkey experienced a banking crisis in 1982 when several brokers collapsed and five private banks were rescued at a cost equal to 2.5% of GNP (World Bank 1989; Atiyas 1989). In Kuwait, because of large losses sustained from speculation in stocks and real estate markets, an estimated 40% of loans were nonperforming in 1986. The government supported the banking system by providing concessional loans (Al-Sultan, 1989). In several Asian countries, including Malaysia and Thailand, financial crises were caused by problems among large numbers of finance companies. These crises were more easily contained because the affected companies controlled only a small part of the domestic market (Sheng, 1992). The crisis was more serious in the Philippines, where both private and public banks experienced large losses between 1981 and 1987. 160 smaller institutions were closed down, while two large public banks and five private banks were intervened. The public banks were restructured in 1986 and their bad assets, corresponding to 30% of the banking system's assets, were transferred to a separate agency. Crises of equal severity were experienced by many African countries, even ignoring those which have been incidental to civil war. Among the larger African countries affected, in addition to the problems of the franc zone, already discussed above, one may mention the cases of Ghana and Guinea. In Ghana, the Government-owned development banks suffered from acute currency exposure as a result of onlending the proceeds of foreign borrowing converted at the official exchange rate on terms that made no provision allowance for what was an inevitable maxi-devaluation. Fraud was the cause of the spectacular crisis in Guinea, where all the major banks were intervened and closed on a single day.

Following these episodes of widespread banking failures, the authorities of many countries took measures to create more robust banking and financial systems. They revamped their prudential regulations and strengthened both their supervisory agencies and their crisis resolution mechanisms. Banks were required to hold more capital, related lending was subject to tighter controls, information disclosure and transparency were improved, and regulators were empowered to intervene at an early stage. Several East Asian countries, including Malaysia, Singapore and Thailand, took such measures. In Latin America, Chile and Colombia took the lead in establishing robust regulatory frameworks and effective supervisory agencies.

Yet despite the experience of the early to mid-1980s, several developing countries fell victim once more to banking and financial crises in the early 1990s. In Eastern Europe and (as mentioned) Central Asia, the governments of most transitional socialist countries were faced with large inherited problems. Despite rather aggressive privatization programs, the banking systems of most of these countries continued to be dominated by state-owned commercial banks that held large amounts of nonperforming loans to state-owned industrial and commercial companies (Borish et al., 1995, Kiraly 1995). Banks in some countries, such as Hungary, suffered from the collapse of the Soviet Union and the European economic recession. In Hungary, several attempts to recapitalize the banks resulted in capital injections totaling almost 10% of GDP without any clear indication that the banks adopted new management structures that will prevent them from decimating their new capital in new loan losses to the same old borrowers. In Latin America, new major crises erupted in Venezuela, Mexico and Argentina. These have been attributed to the lifting of credit and interest rate controls without a significant strengthening of prudential regulation and supervision.

after bad (La Cuadra and Valdes-Prieto, 1992; Valdes-Prieto, 1994). In this, they followed a similar pattern to that of Spanish banks and engaged in distress self lending to delay impending insolvency (de Juan, 1987).

Lending to related parties was still a major source of the problems, although macroeconomic shocks were also to blame, at least in Argentina and Mexico,

2.3 Causes of Banking Crises

What accounts for the widespread, almost worldwide, phenomenon of banking failures and crises? The Norwegian authorities have attributed banking crises to three factors: bad luck, bad policies and bad banking (Solheim, 1992).

Bad luck refers to factors outside the control of policy makers and bankers such as a prolonged international economic recession, the collapse of a major country or region (such as the disintegration of the Soviet Union that had such an adverse economic impact on Finland as well as on several countries of Eastern Europe), the collapse of an important market for a commodity-producing country (such as the large fall of the oil price in the mid-1980s), or a major natural disaster. Attributing bank failures to bad luck smacks of blame shifting as prudent policy makers and bankers could make an allowance for unfavorable external developments and could accordingly adopt more conservative policies. But it may be uneconomic to provide against the simultaneous occurrence of two or more external shocks. An overcautious policy would probably have bigger costs in terms of foregone output and economic growth. The Scandinavian approach of intervening after the fact to provide support to the banking system hit by external shocks but to withdraw such support and aim to recoup its cost once external conditions improve may achieve a better balance between costs and benefits, although the problem of moral hazard and induced changes in future behavior may undermine the long-run soundness of this approach.

Bad policies cover failures of economic policy either at the macro level or at the sectoral or micro level. Thus, most countries that experienced banking failures had engaged in expansionary monetary and fiscal policies. These generated economic booms that were not sustainable in the longer run. Chile in the late 1970s, and Mexico and Argentina in both decades, are only the best-known examples of countries which suffered from overvalued exchange rates combined with excessive expansion of both business and household lending. These involved asset-based bank lending that contributed to asset price inflation. Even when not accompanied by macroeconomic booms, the maintenance and subsequent collapse of unrealistic exchange rates has been at the root of the many bank failures. Unsustainable fiscal policies which may contribute to unsustainable lending booms by encouraging indebtedness by businesses and households. For example, high marginal rates of income taxation combined with tax exemption of mortgage interest stimulate household borrowing. The problem was aggravated in several countries (Sweden and the United Kingdom) where changes in fiscal policy and the tax treatment of mortgage interest were announced long before they became effective and they thus provided a temporary, but disastrous, boost to mortgage demand.

Bad policies at the micro level include the failure to strengthen supervisory agencies and create mechanisms for dealing with problem loans and imminent bank failures. In the US, the thrift debacle was precipitated by cuts in supervisory staff and failure to perceive the growing problems of related lending and abuse of the new business powers that were granted to savings and loan associations in the early 1980s. In developing countries many failures resulted from reliance on politically or socially motivated directed credit from development banks to state enterprises or priority sectors, where grants would have been more appropriate. Poor financial discipline also contributed, including undue forbearance where timely intervention in troubled banks would have been more appropriate.

Finally, bad banking refers to the behavior of banks in the new liberalized markets. Bad banking may be subdivided into three categories: imprudent lending; abusive self lending; and fraudulent behavior. Imprudent lending seems to have afflicted all countries with banking problems. It is often associated with a "herd instinct" and negative externalities. It is generally argued that banks have a comparative informational advantage in analyzing and screening potential borrowers and in assessing the prospects of the projects they finance. But this advantage seems to evaporate under competitive pressures. Individual banks fail to take into account the effect on total market prospects of their own lending decisions. Thus, negative externalities seem eventually to prevail. Banks almost everywhere succumbed to the lure of real estate finance and the presumed safety of collateralized lending. And they failed to take full account of the effects of asset price inflation on the economic feasibility of the financed projects. Bankers involved in making lending decisions seem to have explicitly or implicitly assumed that increases in land or house prices would continue unabated even though they may have been rising at an abnormally high pace.

Such collective incompetence and limited institutional memory is difficult to explain outside a dynamic model that exerts systemic pressures on bank loan officers to adopt optimistic assessments during the expansion phase of an economic cycle and thus charge low risk premia to be followed by very pessimistic reactions during the economic downturn when risk premia may be raised to unjustifiably high levels. Thus, bankers succumbing to systemic market pressures may be exaggerating the business cycle. Some banks resist the temptation and avoid suffering large losses but they are clearly unable to stem the wave of euphoria.²⁴

Abusive self lending involving lending to related companies either at preferential terms and conditions or even worse when the prospects of those companies are very poor is another manifestation of bad banking. Thus, banks in Chile, Venezuela, Colombia, Mexico, Spain, Turkey and Greece abused on several occasions the trust of their customers and provided excessive loans to related companies. Controlling self lending and ensuring that it does not exceed levels that are compatible with prudential norms and is not extended at below market terms and conditions is a major challenge for regulators and supervisors in all countries. It is, however, interesting that related lending is less of a problem among large banks in developed countries. In these countries, self lending seems to occur either in marginal institutions or through finance companies that raise their funds from commercial banks but are not properly monitored and scrutinized in how they utilize these funds. Lending through uncontrolled finance companies was a big problem in Sweden and, especially, in Japan during the 1980s. Related lending also gives rise to a moral hazard problem as banks with substantial amounts of self lending tend to throw good money after bad when the performance and prospects of related companies suffer sudden and substantial deterioration. Spain in the late 1970s and Chile in the early 1980s are the best known examples of this phenomenon.

Outright fraudulent behavior is probably less important as a source of failure than other forms of bad banking. Nevertheless, it often causes failure among small banks; in large banks isolated frauds may generate big losses without resulting in the collapse of the whole bank. Fraud rarely brings down a large

²⁴Imprudent lending often also involves a relaxation of lending criteria and collateral requirements and an expansion in new markets, especially in foreign countries, where foreign banks may lack the very comparative informational advantages that they are supposed to have.

segment of the banking system (though it did in Guinea), but it may contribute to bank failures in an environment of bad policies and other types of bad banking.

The episodes of banking crises may also be attributed to an inadequate understanding of the implications of liberalization and of the much higher risks inherent in a liberalized environment. As already noted, extensive regulations weakened incentives to build up the required credit skills and to accumulate the necessary information capital for appraising credit applications. They also delayed the development of systems for monitoring and managing credit and price (market) risks. To that extent, a learning process may be under way which implies that the incidence of bank failures should decline in the future.

Certainly bankers are now more aware of the risks involved and are likely to adapt their behavior accordingly. There is also greater awareness among both policymakers and practitioners that bad policy may undermine good banking, while bad banking may subvert good policy. More emphasis is being placed around the world on the benefits of pursuing sound macropolicies and on maintaining macrostability. Furthermore, several countries (notably Chile, Colombia and Malaysia among developing countries, and the United States, the United Kingdom, and the Scandinavian countries) have created more robust regulatory frameworks and have empowered their supervisory agencies to intervene at an earlier stage in the unraveling of a bank failure.

But cases such as the United Kingdom, the United States and Spain among OECD countries and Argentina and Venezuela among developing countries, where basic mistakes have been repeated once institutional memories have faded, suggest that the learning process at the level of individual institutions may be rather weak. As for the lessons learned by policy makers and bank supervisors, the new more robust approaches are quite recent and have not been tested yet. Indeed, there are many commentators who argue that the new robust frameworks are aimed at fighting the last war and that future banking problems will most likely arise from new areas.

3. NETWORKS AND BANKING

Summary of the network argument

Disillusionment with the performance of interventionist policies, and a degree of alarm at the consequences of deregulation, leaves the debate on optimal banking regulation wide open. Moving beyond the IIF of Section 2 brings us into disputed territory. The search for guiding principles has led to an explosion of theoretical work on various aspects of the micro-foundations of banking and finance. Though it is too early for a synthesis of this work, a feature that has proved important in several disparate areas, and which may have some broad policy implications, is that models of banking and finance have begun to stress network characteristics.

A network can be thought of as a set of interconnected paths; it is the structured interconnectedness of economic relationships that we wish to convey by the term. In the economic context the paths typically link agents and offer a more effective or less costly way of communicating than simple bilateral trade. A different type of network, the neural network, is also relevant to information and learning problems. A body of mathematical and statistical theory is devoted to various issues in different types of network (cf., for example, Barndorff-Nielsen et al., 1993). Some of the networks studied by applied mathematicians have economic relevance, as with electrical, telecommunications and transport networks. And there are many economic analyses of particular types of network, as well as a growing number of applications of results from the related theory of complex systems.²⁵ But, given the diversity of these applications, there does not appear to be an organized economic theory of networks as such.

Even in the absence of such a theory it appears that most economic policy issues surrounding networks relate to three recurrent characteristics of many networks, namely, externalities, structural redundancy and complexity. First, because of externalities to which they are prone, unregulated networks are likely not to achieve Pareto optimality. Second, network structures can be robust to the failure of one node or segment: alternative (redundant) paths through the network are available. Third, the complexity of the interconnections are such that intervening in one area will typically produce far-reaching and hard-to-predict effects elsewhere as the network adapts to a new equilibrium configuration. The three considerations pull in opposite directions: although networks are not fragile, the pervasive externalities do call for intervention, but the complexity makes successful intervention hard to design.

The potential applicability to banking should be evident. For example, on the one hand, the system is prone to contagion through depositor runs, suggesting the need for prudential regulation. On the other hand, large and famous banks can and do fail without disastrous economic collapse. Furthermore, the externalities involved make it well nigh impossible to design policies that will align the incentives of bank management and ownership with social welfare.

It is not our intention to develop a network theory of banking as such, but rather to employ it as a metaphor, concentrating on policy implications of network externalities, redundancy, and complex adaptive behavior. This policy discussion is resumed in Section 4, but to justify the approach, the remainder of this section looks more closely at the various ways in which the recent theoretical literature has identified

²⁵Liebowitz and Margolis (1994) show how the concept of a network externality, i.e. one which depends on the number of other participants, can be misused. See also Baumol and Sidak (1994), Katz and Shapiro (1994).

network characteristics in banking and finance. The examples come from each of the classic aspects of banking: payments, liquidity and credit.

Network externalities in the payments system

That network externalities are prevalent at the heart of the payment mechanism has often been noted in the literature. The conventional explanation for why money dominates barter is based on such externalities (Ostroy, 1973, Williamson and Wright, 1994), and the same idea recurs in policy-oriented contexts, such as the analysis of optimal currency areas.²⁶ Externalities also arise in modern payment systems networks linking banks in clearing and settling different types of payment instruments. These externalities can provide those banks that have access to the wholesale payments network or to check clearing systems with market power, and regulators are often called upon to ensure access for others who might be excluded. As with the telecommunications network, if the externalities entailed in payment networks cannot be adequately internalized by private institutions, they could generate the need for price or access regulation, though this is arguably of greater significance in respect of the wholesale, or inter-institutional, payments system than for retail transactions (Saloner and Shepard, 1992).

The competitive and regulatory implications of ATM networks provide an interesting illustration. A recent study by Matutes and Padilla (1994) presents a model which describes the dilemma of banks considering whether to join their ATM network with that of competitors. Having a compatible network enhances the product the bank can offer to potential depositors, who will benefit from enhanced network externalities, but (for the same reason) this compatibility risks eroding the bank's market power. Both the decision to join and the related pricing decisions need to take account of the network aspects. There are clearly potential public policy issues here in computing optimal access prices for ATMs. Similar issues arise with credit cards, seen as a means of payment.

Network externalities in liquidity

Network effects in liquidity are most evident in the stock exchange and other organized exchanges such as those for commodities, futures and options. So far as bank liquidity is concerned, network effects are at play at both micro and macro level. A subtle micro-argument implying negative network externalities in liquidity has been suggested in recent theoretical work by Matutes and Vives (1992) and Yanelle (1989). They point out that, since the attraction to a depositor of a particular bank depends on the number of its other depositors (after all, size implies stability and liquidity), large but otherwise inefficient banks may prevail in the market.

At the macro or system level an extensive literature (following the original work of Diamond and Dybvig, 1983) explains that a network externality is at the heart of that regulator's nightmare, the bank run. According to the literature, early deposit withdrawals by some customers from a bank which has tied up its resources in illiquid loans may lead to collapse. The externality derives from the fact that my deposit would

²⁶ Cf. Dowd and Greenaway (1994) who argue that membership of a currency union will be more attractive the more participants it has

be safe if most other depositors left their money in, but all deposits will be at risk if some withdraw. The bank run externality forms the center of one argument for deposit insurance.²⁷

The credit network

Credit too involves a network: the web of inter-related credit arrangements between different agents has substantial potential for externalities of the network type²⁸. Credit information exchanges, consumer credit bureaux and the like²⁹ work well only if most suppliers participate. Other externalities arise in the credit network, though not all of them are strictly "network externalities" in the usual sense of depending on the number of participants.

Gale (1993) points out the "lemons"-type feature in lending decisions where each bank is faced with a pool of applicants some of whom have been turned down by other banks in the network. Faced with such adverse selection, the individual bank will be fearing the "winner's curse". The bank's confidence that it is making a profitable lending decision can thereby be undermined.³⁰ Unless each banker's own screening ability is good enough to outweigh the risk of suffering from the winner's curse, the impact on the volume of credit could theoretically be very severe.³¹ Where information is scarce and mostly private, as in developing economies, the adverse selection argument is likely to assume relatively greater importance, thus inhibiting the growth of intermediation.

Traditional populist concerns about concentration of economic power in banks can be reinterpreted in terms of their role in another network: namely that of corporate control. A recent theoretical literature emphasizes the manner in which debt contracts increasingly govern the transfer of control over poorly-performing corporations.^{32,33} Bank credit plays a central role here: both in regard to transfer of control over existing

²⁷ Dewatripont and Tirole (1994) do not, as is usual, rely on the bank run as the main justification for prudential regulation: instead they see the authorities as representing the interests of small depositors, thereby avoiding costly duplication of monitoring activities that would otherwise have to be carried out by the depositors.

²⁸ Mention may also be made of the early paper by Thore (1969) on credit networks. He analysed the impact of money expansion on the pattern of credit flows through different financial institutions.

²⁹ For instance, similar organizations operated for non-life insurance. The same applies to the multiple listing services used in the US to buy and sell houses.

³⁰ In game-theoretic terms, this is an instance of coordination failure in the presence of strategic complementarity.

³¹ This network effect is independent of other arguments, based on informational asymmetries in the credit market that prevent the banking system from lending enough (or occasionally induce it to lend too much) to achieve a social optimum (cf. for example, de Meza and Webb, 1990).

³² Because of the agency problems entailed by the extension of credit, credit contracts specify the circumstances under which control will pass from the entrepreneur. These contracts are designed to help align the interests of the borrower with that of the lender. For instance, a feature of the standard bond contract is that it removes of any incentive for the entrepreneur to conceal the true value of the firm. Only if the value of the pledged firm truly falls

productive resources, and because access by entrepreneurs to control of additional resources is dependent on their ability to obtain credit. In terms of the network metaphor, banks act as hubs which are on the preferred routes for much of the pattern of control over productive resources in the economy.^{34,35}

Neural networks in credit

Neural networks are rather different in character to the networks we have been considering up to now, but they also have clear relevance. Finance, and especially banking, demonstrates neural network characteristics in that repeated interactions between participants, or repeated use of nodes, helps build information capital (Cf. Shubik, 1990). Repeated interactions can also (through the development of reputation effects) reduce the importance of market imperfections relating to opportunistic behavior.

But we should not assume that neural network-type learning clearly leads to an optimal allocation of loanable funds. Statisticians discuss both trained and untrained neural networks (cf. Murtagh, 1994). The former have a preset criterion function for reinforcing successful or preferred paths. This is the technique most commonly used when a neural network approach to non-linear data-fitting is being employed (cf. Granger, 1991).³⁶ Other networks are untrained and their method for inducing preferred paths evolves endogenously. Both forms of learning are imperfect. The interaction between borrowers and the banking system may be more similar to the untrained type of neural network than to the trained.

The banker typically uses fairly crude decision-rules in deciding whether or not to grant a credit. These rules will be revised, but the criterion for revision is their success in inducing a favorable result for the bank. As the banker's objective function will not usually correspond closely to that of the economy as a

below the cost of repaying the bond will the entrepreneur default (Diamond, 1984). Other more subtle mismatches between the objective functions of entrepreneur and investor lead to more complex financial contracts, in which the circumstances under which transfer of control will occur is a key element (Aghion and Bolton, 1992, Hart and Moore, 1994).

³³ Bolton and Thadden (1995) present a model in which the positive network externalities in liquidity associated with dispersed firm ownership have to be traded-off against the reduced effectiveness of corporate control when ownership is dispersed.

³⁴ The variety of debt contracts used by financial intermediaries in these control relationships - the financial instruments - may be seen as analogous to alternative modes in a transportation network. Many specialized financial intermediaries are involved in only a limited range of modes, but the trend to deregulation has meant that it is increasingly banks which are closest to offering a full range of modes, thereby acting as full hubs in the network.

³⁵ The incentive for bankers to distort or collapse this network structure through concealed self-lending is an important potential source of social inefficiency typically manifested through bank failure.

³⁶ The most extensive use of neural network techniques in finance has not been in to understand the functioning of financial systems, but in a (much-hyped) attempt to improve financial asset price forecasts. There might, however, be a link between these two.

whole³⁷ the decision-rules that are being reinforced will not necessarily be those which maximize economic welfare over time.

In simple situations this may not matter much, but where such features as externalities and increasing returns are quantitatively important, initial conditions can strongly influence the evolution of the economy (Arthur, 1989). These initial conditions can include the stock of creditworthiness, and how it is distributed among potential borrowers. By relying on tried and trusted credit paths the banking system may be locking the economy into an inferior growth path.

No-one has yet carried out much formal analysis of how the evolution of economies might depend sensitively on initial conditions as a result of the credit network.³⁸ But such dependence is likely to become a widely discussed link between the new theories of endogenous growth and policy analysis of institutions. It could, for instance, enrich the theoretical basis for the empirical links between financial institutions and growth discussed by King and Levine (1993a,b), and perhaps help to explain their results.

Redundancy and complex adaptation

Examples from finance can also be provided for the other two characteristics which we have highlighted for networks, namely redundancy and complex adaptation.

For redundancy, the arbitrage possibilities underlying covered interest parity would be an example in the payments area. The availability of liability management as an alternative to asset sales for generating liquidity also illustrates redundancy. Redundancy is so familiar in the credit market that we have a neologism for its most common manifestation: "disintermediation".

Complex adaptation

The payments systems of Ghana and Liberia around 1990 provide an interesting example of sharply divergent evolutions, as Ghana had no coins, but Liberia had no banknotes. This curious contrast was the outcome of fiscal pressures in both countries impacting subtly different regulatory and institutional structures in the two countries (Honohan, 1993).

The scale of the US stock market collapse of October 1987 reflects a leverage induced by the unraveling of a network of linkages put in place by market participants to provide liquidity. In this case a rather modest initial disturbance was greatly magnified as an over-burdened liquidity network attempted to readjust.

Credit markets also have the potential for multiple equilibria, and to respond to changed circumstances in unpredicted ways. Surely the best-studied example of complex adaptation to policy change under conditions of structured interconnectedness here is the US savings and loan collapse, where the

³⁷ Especially if the bank is relying on debt contracts whose payoff to the bank is a strictly convex function of the economic benefits of the activity being financed.

³⁸ This can be seen as an instance of complex adaptive behaviour of the system.

metamorphosis of a large segment of the system following a number of shocks was clearly contingent on a set of interlocking mechanisms and contractual links (including deposit insurance).

Less dramatic examples can be found in the corporate control network:

The unanticipated emergence and dominant role of investment funds in the Czech experiment with voucher privatization. Although no particular role had been officially envisaged for investment funds in that process, private operators took advantage of the opportunities that presented themselves.

The unexpectedly key role of the mandatory pension funds in Chile, resulting from their large collective holdings mainly of privatized utilities.

In Russia, another type of corporate control structure appears to be emerging with a small number of large banks "managing" significant segments of industry that they do not "own".³⁹

Whatever the merits of these developments, the implication is clear: unanticipated innovation can change the financial environment dramatically.

Some uses of the network metaphor

The usefulness of modeling the financial system as a network lies in two different dimensions. Not only is it needed in formal modeling to capture important structural features that are essential to aspects of the financial system but (less formally), it also suggests certain analogies from the evolution of other networks that may prove relevant in looking to the future of the financial system and the likely path of optimal policy.

We have already mentioned three areas of direct relevance:

Network externalities create the potential for allocative inefficiency, potentially corrected through regulation or sometimes through an appropriate assignment of ownership.

The issue of redundancy, typically inherent in the network structure itself, with multiple paths available. Redundancy is crucial for the effective functioning of some networks, such as electrical power transmission, where it is essential to avoid system failure, but costly or impossible to ensure absolute reliability of hubs or paths.

The complex adaptive nature of optimal network structure: disturbances propagate through the system in ways that are hard to predict. For example, the emergence of new modes or changes in the volume of demand may alter the equilibrium flow through existing paths in surprising ways, as with the emergence of the hub-and-spoke system of air transportation in the US in response to

³⁹These three cases have features in common with the situation in South Africa, where two large insurance companies own strategic holdings, and appoint managers, but allow them considerable operational freedom provided some financial objectives are met. This in turn is similar to the behaviour of conglomerates such as Hanson and BTR in the UK.

availability of wide-bodied aircraft. Policy intervention is likely to be rewarded with similarly unpredictable responses.

A curious feature of the Internet provides a further analogy, the relevance of which to finance may be debated, namely the fact that the US government agency which initiated the Internet and provided its basic infrastructure is no longer needed for the satisfactory operation of the Internet, and has, reportedly, withdrawn from this provision.

There may also be something to be learnt from the literature on the incentives for technological innovation under conditions of network externalities: the theory predicts that sometimes a desirable innovation is inhibited, but sometimes too a bandwagon sweeps a technology into operation beyond its social desirability.

The network metaphor, and in particular the concept of the neural network, thus has implications for the evolution of the structure of the financial system and for the design of optimal financial policy and regulation. For instance, new types of financial institutions are created to fill perceived gaps in the financial system. The gaps may be caused by regulation or by neglect by existing institutions. The new institutions provide new paths bypassing defective or blocked paths. Similarly, financial policy responds to the emerging new institutions and new practices and regulation is amended to strengthen or unblock existing paths or to support the development of the new paths. Of course, regulators may try to block the new paths but in the longer run this may turn out to be futile as private agents always succeed in bypassing the restrictive effects of regulation, perhaps by moving offshore.

4. OPTIMAL FEASIBLE REGULATION

As financial systems evolve in complexity and sophistication, so the policy issues increase in subtlety. Governments are concerned not only with avoiding bank failures, especially when it is the taxpayer on whom most of the incidence of losses falls, but also with ensuring that their financial system is effective in providing financing for growth as well as ensuring an adequate access to loanable funds and other financial services for disadvantaged regions and ethnic or other groups. They want to go well beyond the IIF of Section 1 in order to improve performance, whether in terms of safety, effectiveness or fairness.

We have seen that dissatisfaction with the performance of the heavy-handed regulation of the early post-war years was followed by a process of de-regulation which has in turn been followed by a wave of costly bank failures. While talk of re-regulation is tempered by an awareness that technological changes make a simple reversal impossible, there is dissatisfaction with the performance of the existing regime. The industrial world is pre-occupied with avoiding failure, but issues of effectiveness and fairness (which are relatively more pressing in the transition economies and in the developing world) also belong to the policy debate. But there is no agreement on the correct approach or even on what policy can realistically be expected to achieve.

Should policy move in the direction of increasing refinement, or should policy-makers be seeking a simple, robust approach? The message of the previous section seem on balance to favor the latter approach. The network externalities of many different types which increasingly prevail in the financial system certainly imply static market failures and an *a priori* case for intervention. But by the same token the limited effectiveness of intervention, the ease with which controls can be by-passed, and the difficulty of assessing the full system-wide consequences of many plausible interventions imply the desirability of using a light hand in adding to the basic institutional infrastructure which has been advocated in the earlier sections.

The messages from the network perspective highlight the trade-off that exists between different objectives as well as the risk that well-intentioned measures may misfire. Some distortions of economic power and sporadic bank failures may be prices that have to be paid in order to allow the system to finance unpredictable growth-oriented financing needs and to evolve necessary institutional innovations. The history of financial regulation suggests a degree of policy modesty.

4.1 Policy for safe and sound banking

The conventional wisdom and some proposed refinements

There is an accepted core of wisdom concerning the essential design features of the "financial constitution"⁴⁰ underlying prudential regulation for the modern financial system. The aim is to apply a stable, liberal regulatory environment, create a contestable market with free qualified entry and exit, and ensure appropriate incentives for efficiency and innovation. Such a constitution does not place arbitrary entry, branching and merger restrictions; but it does require risk diversification (including limits on lending to related parties and on large exposures) and the accumulation of capital reserves to absorb losses.

⁴⁰Cf. Vittas (1992c). In essence, this can be seen as a fleshing out of aspects of the IIF of Section 1 above.

Appropriate prudential norms to ensure adequate risk-based capital backing and effective internal systems of risk management and control are mandated. Can one do better than this by going further in regulation?

We have shown that a kind of contagious euphoria has frequently preceded banking crises. This looks like another network externality, this time negative, and the corrective policy known as "speed limits" that has been proposed to prevent overlending during the euphoric phase of the economic cycle, makes sense in those terms. These would be limits on the growth rate of asset accumulation by financial institutions. The limits could be linked to each institution's capital position allowing more rapid growth for those whose capital allowed them to assume the greater risk that is inevitably associated with rapid growth. As the limits would only bite during occasional spurts of rapid expansion, their static distortions would be moderate, and it would not be as easy for the financial network to by-pass them as it does permanent restrictions.

Mandatory portfolio limits designed to ensure adequate diversification can also be viewed as an attempt to ensure that particular institutions are adequately linked to the financial network and are thereby benefiting from its risk-sharing capacity. Once again these limits can be related to an institution's capital base.⁴¹

The historical context of different financial systems may also create the need for policy action not so evidently required in some of the more sophisticated economies. For example, the history of abuse of the financial system by powerful economic groups in Mexico and Latin America suggests that anti-trust legislation might be useful in these countries. Yet, in more advanced countries where market information is more widely available, anti-trust legislation may not be required.

Increasingly elaborate regulatory rules on capital adequacy have been proposed (beyond those already adopted) both in terms of the calculation of risk-weightings (including new attempts to cope with the various risks associated with derivatives) and in terms of varying the capitalization requirements over time, depending for example on the state of the macroeconomy.⁴² Although highly complex regulatory rules may demonstrably improve incentives in a worked out model of a single bank's behavior, they may fall foul of the complex adaptive pattern of the financial network as a whole. In the present state of knowledge, network considerations would argue for caution in over-complicating the rules. After all, it is much easier to identify and unwind the unintended system consequences of simple regulatory rules.

As an alternative to increasing the complexity of regulation and the burden of supervision, some have suggested making failure more costly for the management and shareholders of the banks themselves. For example, recognizing that those who control profitable banks holding a valuable franchise will tend to be prudent in order to avoid loss of the franchise, some authors have considered models which call for preferential tax treatment or subsidies for banks. Other models generate the conclusion that restrictions on entry or branching (for example), though resulting in monopoly profits, can pay for themselves in terms of improved credit allocation and a reduced risk of failure (cf. Gorton, 1994).

⁴¹For a brief discussion of this approach, see Vitas (1992b). The use of growth and portfolio limits is also briefly discussed in Litan (1992).

⁴²Dewatripont and Tirole (1994) is a sophisticated analysis of such a framework.

But since widespread bank crises are often associated with the negative externalities created through overlending and optimistic assumptions during the euphoric expansion phase of a cycle and the underlending and pessimistic outlook during the dysphoric contraction phase, then we may have some doubt that franchise value will do the trick. Limiting the number of banks does not appear to have sheltered countries with highly concentrated banking markets from the excesses of the bank lending cycle. For one thing, if banks remain aloof, finance companies and other types of financial institutions may become involved and may propel the expansion phase with both imprudent and abusive self lending. And if finance companies are not allowed to emerge, then the nonfinancial companies themselves may expand their trade credit and other forms of lending directly to other businesses or households. Commercial paper and other securitized markets may also emerge to provide the finance that is demanded by an expansion-minded economy but is not provided by the financial sector.

Limiting entry into banking in an attempt to increase its franchise value will also militate against innovation and technological progress as new banks are definitely more likely to adopt new practices, new products and new technologies than old banks. By freezing the network, entry limitations stultify it.⁴³

Besides, translating theoretical predictions into practical recommendations requires an awareness of the political economy dimensions of the issue. However subtle the rationale for their introduction, tax breaks, subsidies or other advantages for banks may well open the door to crude distortions achieved by special interest lobbyists. This is usually observed when attempts are made to protect a sector from competitive pressures. As a result, the general presumption against such privileges seems hard to overturn.⁴⁴

Limits to supervision

It is one thing to introduce regulations, another to supervise the performance and solvency of the regulated institutions. One must be realistic about the information and expertise available to regulators.⁴⁵ Network

⁴³ As well as increasing systemic fragility (see below).

⁴⁴ On the other hand, arguments for financial repression as a useful source of government revenue are likely to be substantially weakened by the progressive improvements in the administrative effectiveness of more efficient means of taxation, such as the value-added tax and PAYE income tax.

⁴⁵ Recall also that reliance on prudential regulation assumes the availability of a skilled, impartial and authoritative official supervision agency, something that is not always easy to provide. It is not hard to be convinced of the practical relevance (where regulators lack experience or authority) of such problems as theoretically illustrated by Boot and Thakor (1993). Their model describes an imperfect regulator reacting to new information which suggests that an earlier regulatory judgment was too lax, and that bank management is assuming too much risk. Because corrective action now will expose the regulator's earlier error of judgment, the regulator too becomes caught up in the risk-taking, and gambles, along with the management, on the success of the risky strategy which alone will enable the regulatory error to be concealed.

Besides, heavy reliance on regulation has the effect of retaining in the system a scope for corruption which can drastically worsen economic performance. Adapting Shleifer and Vishny's (1993) model to bank regulation, we can picture a corrupt regulator turning a blind eye to optimistic loan classification, or tolerating excessive lending to related parties, in return for a side-payment (e.g. a low interest loan). The lowering of prudential standards will spread throughout the system, encouraging a socially excessive level of risk-taking with adverse budgetary consequences when implicit or explicit deposit insurance kicks in.

considerations greatly complicate their lives. The blurring of boundaries between banking and other financial institutions is a key factor here, and not only because the associated decline in bank profitability⁴⁶ increases their vulnerability, as witness a general tendency to decline in their credit-ratings.⁴⁷ The erosion of boundaries goes hand and hand with an increase in network interdependencies affecting banks.

One aspect of this is the growing importance for banks of the management of portfolios for which market price risk (interest rate, stock price or exchange rate changes) are more important than credit risk.⁴⁸ Bandwagon effects in these speculative markets probably increase the instability of interest rates and asset prices, and thereby of other macroeconomic conditions. This in turn feeds back on the vulnerability of banks.

More generally, because of the much wider variety of contingencies which can have a material effect on the solvency of banks, it is harder to assess the capacity of each bank to face future risks. When banks were conducting a traditional bills, loans and deposits business, application of simple ratios gave a pretty good assessment of the health of the bank, at least when combined with a qualitative assessment of the probity and general administrative and managerial competence of the principals. Nowadays, with highly leveraged and frequently-traded contingent assets and liabilities in the picture (including open-ended insurance commitments, securities underwritten, and a range of mathematical derivatives⁴⁹) not to speak of the uncertainties entailed by counterparty risk (including that generated by reinsurance contracts which may be repudiated in bad times), maintaining an up-to-date evaluation of solvency seems well-nigh impossible.⁵⁰ This is true for the bank's own management, and doubly so for the supervisor especially when, as in many cases the bank's management sets out to deceive the supervisor.

Furthermore, the complex ownership structures characteristic of a re-emerging breed of financial conglomerates may serve to conceal not only potential conflicts of interest, but also the true leverage involved, for example where inter-group loans or guarantees are present. The apparent exposure (in the Barings case) of owners of mutual fund units to the collapse of a banking affiliate of the fund manager is just one example of the inadequacy of "firewalls" apparently built into conglomerate structures (cf.

⁴⁶With traditional core banking activities opened to new competitors.

⁴⁷Which in turn reduces their capacity to intermediate at the top end of the market. Market segmentation and the high credit rating of banks in the industrial countries derived from the old regulatory regime which is now being progressively dismantled. Note however that, despite all the changes, line of business and ownership restrictions do remain important in most industrial countries (Borio and Filosa, 1994).

⁴⁸Securitization of bank loans has contributed to this process, and has been part of the wider process of unbundling and repackaging assets into derivative securities.

⁴⁹Designed to exploit and harness market risk.

⁵⁰In fairness, and while supervision will never be able to provide early warning of all failures, it is arguable that the major technological leaps in the area of derivative instruments are already behind us and that prudential technology now has a chance to catch up. In particular, the mathematical complexity of compound derivatives should not be beyond the mastery of government regulators.

Corrigan, 1987). These are instances of the complexity characteristics we have already noted for networks. It is hard for the supervisor to predict how a particular disturbance might impact the equilibrium structure, and ultimately the solvency, of an elaborate network, whether that be a single financial conglomerate, or several interacting conglomerates.

Of course, network redundancy is also relevant here. Regulatory arbitrage becomes virtually uncontrollable when the dividing line between regulated banks and unregulated non-banks no longer clearly delineates financial products which are close substitutes. Attempts to regulate or re-regulate a particular instrument or activity often result merely in the emergence of a close substitute provided by a nonbank, perhaps with explicit or implicit ownership links with the bank.

Acceptable risk of failure

If the elaboration of the banking network has so complicated supervision we may have to conclude that banking failures cannot be avoided. This would also seem to be the message from history. Indeed, bearing in mind that banking houses have been prone to collapse throughout the centuries since the Bardi and the Medici financed trade and the extravagances of princes, what strikes one again and again on reading the history of bygone eras is the structural similarity between the characteristic causes of bank failure in what would appear on a superficial examination to be widely differing circumstances. Internal fraud, foolish and incautious staff in remote offices, allowing one's portfolio to become too heavily leveraged with respect to the macroeconomic conjuncture, and the occasional spectacular confidence trick have all been present in each of the past seven centuries. Some new elements do emerge: the "too big to fail" doctrine has, perhaps, only been with us since the nineteenth century, but before then there was a "too big to be stopped" syndrome. Likewise the altered incentive structures provided by implicit and, especially explicit, deposit insurance seem essentially new.

Although financial crises and collapses cannot be entirely avoided, we will argue that it is also true that most bank failures are absorbed reasonably smoothly, largely because of the network redundancy of which we have spoken.

Of course bank failures have distributional effects, but how substantial are the systemic costs which they impose on society?⁵¹ There are historical events to which one could point as illustrations of very severe consequences. Many of these occurred against a background of macroeconomic policy failure or of adverse external non-financial shocks, and could be seen themselves as consequences rather than independent causes of widespread distress. Besides, the bulk of instances of bank failure are not of that character. In particular, while the deposit contract is theoretically prone to runs by uninformed depositors at times of heightened uncertainty caused by a bank failure, the frequency of such contagion effects is not high (Selgin and White, 1994). Besides, they usually affect only a part of the banking system and for a short time, and they have usually been offset by the interbank market or by the central bank.

Even where a large part of the banking system has become insolvent, the position has usually been met by government subsidy with only limited deadweight losses. Even the savings and loan crisis in the USA, the largest collective financial sector failure to date, did not exceed the capacity and willingness of the US

⁵¹Admittedly, as mentioned earlier, there is a presumption that bank failure reflects misallocation of loanable funds. But it does not follow that the funds of solvent banks have always been put the best social use.

federal government to bail out depositors, although it did exacerbate the fiscal deficit, and in the long-term will have led to higher tax rates. The same is true of the substantial bank failures in Scandinavia, Spain and France in recent years.

Are the checks and balances that are built into the system such as to cause bank crises to burst before they get too large to be dealt with, or are unmanageable banking crises simply inherently rare?⁵²

It does seem that the finance network contains sufficient redundancy to continue to function despite isolated failures. Ensuring this capacity, rather than attempting to forestall all possible bank failures may be the key to feasible bank regulation. The implications for competition policy here clearly conflict with the idea of ensuring a franchise value for banks, mentioned above. While the latter is seen *inter alia* as being required to prevent excessive risk taking, it could be counterproductive if pursued to the point where it leads to just a few institutions handling the whole of a relatively closed and fragile system.

If the consequences of bank failure are primarily distributional in nature, often spread widely through taxation, and if they do not result in catastrophic disruption to the operation of the financial system or of the economy, then it is possible to take a more relaxed view of bank failure than is customary. From this perspective, one may think of the regulatory system as a mechanism for limiting the exposure of the taxpayer to risk. At some price, bank failure becomes an acceptable risk (cf. Caprio, 1994). *Ex post* corrective action can be less costly than excessive *ex ante* preventative measures.

As will be clear from earlier sections, that is all very far from suggesting that no regulatory structure is necessary, though some authors have explored this opposite extreme, namely the removal of all regulatory constraints and the operation of "free banking". The main arguments in favor of "free banking" are that the rule of *caveat emptor* is a reliable way of inducing prudent investor and banker behavior, and that the introduction of regulation and depositor protection weakens these incentives, and may introduce other distortions. The experience of 18th Century Scotland is often quoted as a successful example, though it is clear that it was a market which comprised a small elite of business-people most of whom were mutually acquainted. The applicability of the example to the current environment is doubtful: information flows are much improved now, but the market participants are much more diverse (cf. Caprio and Vittas, 1995).

It is worth mentioning that the arguments of theoreticians in favor of the need for regulation are different to those of policymakers. Theoreticians point to various reasons why market-failure will prevail in financial markets even with rational agents; policymakers worry about the potential losses to gullible investors. Unattractive though the policymakers' perception may be to the theoretician, it is undoubtedly important in practice. Gullibility comes from lack of experience, and much behavior in the financial system is based on reputation and experience with well-tried contracts and practices. Even if the "free bankers" were right in an equilibrium of rational investors they must surely be wrong in a transitional phase.

⁵²Thus we note that the Barings collapse occurred at a stage when the losses were no larger than the sum of the shareholders' (and subordinated bondholders') funds plus the estimated present value of the firm's future earning possibilities. In this case, therefore, despite inadequate internal controls and an apparently almost unlimited scope for losses, given the nature of the transactions being undertaken by an inadequately controlled official, the losses were contained to what could be borne by those who were willing and able to bear risks.

The wave of banking failures which has swept the world in the past decade or so is rightly regarded as the price which had to be paid for deregulation. While fraud and macroeconomic instability played their part, in many cases the proximate cause of the failures can be said to have been lack of experience on the part, either of bankers or their customers, in particular types of contract or transactions. Deregulation altered the institutional configuration within which the financial network had evolved and (quite apart from the fact that some regulation continues though in an altered form) it was not accomplished as smoothly as the withdrawal of the government framework on which the Internet was built. Lack of experience of the newly available territory - a form of "gullibility" - inevitably led to problems. In the new more competitive environment, banks succumbed more easily to the systemic pressures for excessive asset-based finance during the expansion phase of the cycle. Further liberalization in the future can be expected to have similar effects - though presumably manifested in somewhat unpredictable ways.

4.2 Policy for effectiveness and fairness

Though most recent attention has focused on the question of limiting bank insolvency, we must not neglect the other objectives which policy in regard to the control of banking has sought to achieve, mostly falling into the categories of effectiveness and fairness. Under the heading of effectiveness, we include concern that the financial system should provide adequate means of financing available to ensure growth and development. Countless official reports have bemoaned the lack of term finance, or of finance for small enterprises, and argue that development and growth have been hindered by these shortcomings. Attempts to limit consumer credit, and to retain national control over finance by limiting foreign ownership, also fall into the same category. The arguments that come under the heading of fairness may overlap with the developmental, but are typically couched in terms of regional (including urban/rural), sectoral and distributional objectives, avoidance of discrimination on grounds of ethnicity or gender, anti-monopoly and consumer protection. While these arguments are more often heard in developing countries, they continue to influence policy to some extent in most industrial countries.

In our discussion of the networks associated with credit (Section 3 above) we have already illustrated the theoretical validity and potential importance of distortions of some of these types. Although that does not prove that every suspicion of unfair treatment is well-founded, or that measures to boost bank lending for small enterprise will represent a good use of loanable funds, the path dependency arguments and the possible non-linearities do suggest that the marginal benefit from measures that succeed in reducing the effect of some of these distortions could be very considerable.

Unfortunately, simple administrative mechanisms such as directed credit,⁵³ interest subsidies and the like are easily evaded, especially in developing countries.⁵⁴ Nevertheless, they continue to be employed and even newly introduced schemes are to be found in industrial countries. Such schemes are likely to be more effective when imposing relatively modest apparent cost penalties to banks and where administrative compliance is more easily monitored.

⁵³ Already discussed in Section 2 above.

⁵⁴ Cf. World Bank (1989).

Apart from simple mechanisms of this kind, the effectiveness of the banking system in helping ensure economic growth may be strongly influenced by structural policies, of which the most widely discussed is the question of universal banking.

Universal banking

While there are safety and soundness aspects to the debate over universal banking, it has mainly been concerned with two other issues: concentration of power and the overall effectiveness of the banking system in ensuring good use of loanable resources.

The approaches adopted to these questions by scholars have been both theoretical and historical. But the potential for drawing simple policy conclusions from a historical comparison of the overall performance of (for example) the German and Japanese financial systems on the one hand (as representative of bank-based regimes) and the British and UK systems (representing market-based systems) is limited by the complexity of the differences in institutional and regulatory structure in these various economies.⁵⁵ Indeed the very fact that legislation in both Japan and the US ostensibly separate investment from commercial banking, while this has not been the case in Germany or the UK, highlights the dangers of jumping to recommendations (Borio and Filosa, 1994).

Some of the fears of those who criticize universal banking on the basis of the conflicts of interest which it can entail and the suggestion that it may increase prudential risks should have been assuaged by recent analysis of the US experience both before and after the limitations of the 1930s. Focusing on the suggestion that universal banks would have taken advantage of gullible clients by selling low-quality bonds on behalf of firms to which they had outstanding loans, Kroszner and Rajan (1994) provide convincing evidence against the hypothesis for the 1920s.⁵⁶

Apart from questions of consumer protection and prudential risk, there is the question as to whether banks or markets provide the best governance relationships, and make the best decisions as to where credit will go. A plausible middle ground on this debate holds that for each one there are circumstances in which it dominates the other. Thus a bank-led system may be more effective when information is scarce, and potential evaluators few, while the market system may have merit when information is plentiful, but where there is scope for divergence of views as to future prospects.^{57,58}

⁵⁵ Allen and Gale (1995) provide an insightful discussion of these issues.

⁵⁶ Benston (1994) summarizes related arguments in favour of permitting universal banking.

⁵⁷ Or where personal relationships between financier and entrepreneur could handicap the downsizing and closure decisions that may be necessary.

⁵⁸ Recent developments in the US and UK suggest that securities markets dominated by institutional investors face the same conflicts of interest and imperatives in monitoring corporate performance and influencing governance as universal banks. If so, the differences may be more semantic than substantive.

A different argument provided in favor of the large, universal bank is that it has the capacity to redistribute risk between generations in a way which is not available through the securities markets (Allen and Gale, 1995).⁵⁹ Effectively, the arguments for the big-bank model are arguments that some aspects of the network should be institutionally internalized. Whether such internalization is likely would depend partly on the banks' ability to maintain cost-competitiveness in the business of intermediation, a matter which will be influenced by the degree to which cost penalties are imposed by regulation, but will also depend on technological and managerial innovation. If banks progressively lose market share of savings to securities markets, then the potential borrowers that have no access to securities markets (small enterprises, households) could experience a worsening terms of trade. There may also be a tendency for geographical concentration with depositors' funds migrating to major centers more easily than can the borrowers.⁶⁰

Few can claim that the question: "Do financial systems work better with universal banking?" has been adequately resolved. Given the certainty that proscription of universal banking will drive some business offshore and lead to other evasions, this ignorance makes it hard to advocate such proscription.

⁵⁹For example, they point out how savers with German universal banks have been insulated from fluctuations in the market value of equity.

⁶⁰On the other hand, the development of markets as those for securitized mortgages and credit card receivables may offset this tendency, and households may benefit from better pricing of risk and other services. Small firms could also benefit as banks refocus their operations to specialize in areas where they have a comparative advantage: i.e. where private information about the character and skills of borrowers are important for assessing creditworthiness and where monitoring can be combined with other banking services.

5 CONCLUSION

Despite the growing complexity of banking and financial systems, there are some unambiguous messages. For one thing, we have seen that application of a few simple structural rules goes a long way to avoiding the worst kinds of financial sector failure. That many recent instances of such failure can be documented shows that this finding is not a vacuous one. Indeed, its implementation is still the major policy priority in probably a majority of transition economies, and is also required elsewhere.

But banking policy has always been more ambitious than this, both at the macro and micro level. Dissatisfaction with the diminishing effectiveness of the post-war regimes of banking regulation led to substantial deregulation. In its wake came several waves of bank failure and bank crisis, only some of which could be rationalized as the manifestation of previously hidden insolvency. Certainly bankers went through a learning process before adjusting to the deregulated regime, and they seemed particularly vulnerable to a form of contagious euphoria, often manifested in overlending to property developers. Given the recurrence in history of carbon-copy banking failures, however, it is clear that private learning will not go so far as to eliminate all bank failure.

The design of optimal policy, not only for achieving safety, but also for ensuring the effectiveness of the banking system, and an equitable share in its services for all sections of the community, is still a major policy concern. But the disappointing performance of both the regulated regime and the deregulated leaves a certain vacuum, which theoreticians have been trying to fill. A feature of many theoretical studies of banking is the recurrence of the concept of a network to describe either the system as a whole, or aspects of it. Among the characteristics of many networks are their proneness to externalities, their redundancy (ensuring that flows cannot be obstructed by blocking just one path) and their tendency to adapt in a complex manner to disturbances. Taken together, such characteristics can on the one hand justify regulation, but on the other hand point also to the likely ineffectiveness of much regulatory effort, and to the unpredictability of the system's response to regulatory measures.

Applying this perspective to current policy issues leads us to suggest a degree of modesty in banking policy. A basic regulatory framework is certainly needed to reduce the incidence of bank failure; we are not advocating *laissez faire*. We emphasize measures to ensure risk diversification and adequate capital reserves. We even allow for growth and portfolio limits, linked to capital resources, on the grounds that such controls are institution-neutral and will not be as readily undermined by network effects as other types of regulation. But we argue that both over-elaborate regulation, and the alternative of increasing franchise value (through limited entry or otherwise) fall foul of network-based critiques. We are against restrictions on branching, mergers and business powers, against elaborate capital requirements (too difficult to calculate and verify), against entry restrictions to increase franchise value and against proscription of universal banking (because no conclusive case has been made against it).

Supervision has a role in verifying the presence of effective internal information and management systems and in early intervention to avoid the heavy costs of forbearance. However, the blurring of boundaries between banking and the remainder of the financial network has placed an upper-bound to the effectiveness of supervision. We will have to put up with bank failures (mitigated by deposit insurance to protect small savers) and indeed we argue that - partly because of network redundancy - the social costs of bank failure are not as high as is sometimes thought.

Many of the other commonly discussed policy objectives, mostly relating to the dynamic effectiveness of the banking system and to issues of fairness, can be rationalized in terms of correcting for network externalities. For example, the universal bank can be seen as a way of internalizing a whole segment of the financial network in a single institution. The appropriate role of policy here depends crucially on correct specification of the model; when the relevant networks have complex adaptive characteristics the wrong model can give very misleading results.

While the forces of redundancy, as exemplified by regulatory arbitrage, militate against subsidy or directed credit solutions to problems of fairness, network ideas suggest that the marginal impact of small interventions here can be so large as to justify the distortions involved.

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